WHAT IS CLAIMED IS:

1. A thin film magnetic head comprising a lower core layer, a bottom pole layer formed on the lower core layer separately therefrom or integrally therewith, a nonmagnetic gap layer formed on at least the bottom pole layer, an upper core layer to be joined to the top of the gap layer at a surface facing a recording medium, and a coil layer formed behind the bottom pole layer in the height direction, for inducing a recording magnetic field in the lower core layer and the upper core layer;

wherein the upper core layer comprises a tip region exposed with a track width at the surface facing the recording medium, and a rear end region extending backward from the end edge of the tip region in the height direction so that the width dimension in the track width direction gradually increases in the height direction; and

wherein the space between the tip region of the upper core layer and the bottom pole layer comprises a portion extending backward from the surface facing the recording medium in the height direction, in which only a gap layer is present, and a gap depth is regulated by the end edge of the portion, and a portion extending backward from the end edge in the height direction, in which an insulating layer is present together with the gap layer or with the gap layer removed so that the gap between the tip region and the bottom pole layer in the portion comprising the insulating

layer is larger than the gap in the portion comprising only the gap layer.

2. A thin film magnetic head according to Claim 1, wherein the insulating layer comprises a partial insulating layer formed on the bottom pole layer through the gap layer or directly on the bottom pole layer, and the gap depth is regulated by the distance between the bottom of the medium-facing surface-side end of the partial insulating layer and the medium-facing surface, the tip region of the upper core layer being formed to extend from the gap layer to the partial insulating layer.

3. A thin film magnetic head according to Claim 2, wherein the thickness of the partial insulating layer is 0.1 μm to 1.0 μm.

4. A thin film magnetic head according to Claim 2, wherein the thickness of the partial insulating layer is 1 to 10 times the thickness of the gap layer.

5. A thin film magnetic head according to Claim 2, wherein the end surface of the partial insulating layer on the medium-facing surface side thereof is inclined or curved so that the thickness of the partial insulating layer increases in the backward height direction, and the top of the partial insulating layer is planarized.

6. A thin film magnetic head according to Claim 2, further comprising a first insulating layer formed between the bottom pole layer and the lower core layer, the partial insulating layer being formed on the bottom pole layer and the first insulating layer through the gap layer.

7. A thin film magnetic head according to Claim 6, wherein a planarized surface is formed at the top of the first insulating layer to be continued from the upper surface of the bottom pole layer, the partial insulating layer being formed on the planarized surface.

8. A thin film magnetic head according to Claim 6, wherein a coil forming surface is formed in a portion of the first insulating layer which is behind the planarized surface in the height direction and lower than the planarized surface, the coil layer being formed on the coil forming surface through the gap layer or directly.

9. A thin film magnetic head according to Claim 2, wherein the partial insulating layer comprises an organic insulating layer.

10. A thin film magnetic head according to Claim 2, wherein the length dimension of the bottom pole layer from

the surface facing the recording medium in the height direction is 0.5 μm to 3.0 μm.

11. A thin film magnetic head according to Claim 2, wherein the height dimension of the bottom pole layer is 0.3 μm to 2.0 μm.

12. A thin film magnetic head according to Claim 1, wherein the rear end surface of the bottom pole layer is inclined or curved so that the thickness of the bottom pole layer gradually decreases in the backward height direction, and the gap depth is regulated by the distance between the top of the rear end surface and the surface facing the recording medium; and wherein a first insulating layer is formed to extend from the top of the rear end surface of the bottom pole layer to the lower core layer, a planarized surface is formed at the top of the first insulating layer to be continued from the top of the bottom pole layer, and the tip region of the upper core layer is formed to extend from the gap layer formed on the bottom pole layer to the gap layer formed on the planarized surface or to the planarized surface.

13. A thin film magnetic head according to Claim 12, wherein the first insulating layer has a coil forming surface which is formed behind the planarized surface in the height direction and lower than the planarized surface, the

coil layer being formed on the coil forming surface through the gap layer or directly.

14. A thin film magnetic head according to Claim 1, wherein the gap depth is 0.3 μm to 2.0 μm.

15. A thin film magnetic head according to Claim 1, wherein the bottom pole layer has a higher saturation magnetic flux density than the lower core layer.

16. A thin film magnetic head according to Claim 15, wherein the bottom pole layer comprises a laminate of at last two magnetic layers in which the nearer to the gap layer the magnetic layer, the higher the saturation magnetic flux density.

17. A thin film magnetic head according to Claim 1, wherein at least the tip region of the upper core layer comprises a laminate of at last two magnetic layers in which the nearer to the gap layer the magnetic layer, the higher the saturation magnetic flux density.

18. A thin film magnetic head according to Claim 1, wherein the gap layer has a track width at the surface facing the recording medium, and the portion of the bottom pole layer, which contacts the gap layer, has a width dimension corresponding to the track width.

19. A thin film magnetic head according to Claim 1, wherein the width dimension of the tip region of the upper core layer in the track width direction corresponds to the track with Tw or gradually increases from the surface facing the recording medium to the end edge.

20. A thin film magnetic head according to Claim 2, further comprising a first insulating layer formed between the bottom pole layer and the lower core layer, the partial insulating layer being formed directly on the bottom pole layer and the first insulating layer.

21. A thin film magnetic head according to Claim 20, wherein a planarized surface is formed at the top of the first insulating layer to be continued from the upper surface of the bottom pole layer, the partial insulating layer being formed on the planarized surface.

22. A thin film magnetic head according to Claim 20, wherein a coil forming surface is formed in a portion of the first insulating layer which is behind the planarized surface in the height direction and lower than the planarized surface, the coil layer being formed on the coil forming surface through the gap layer or directly.

23. A method of manufacturing a thin film magnetic head comprising:

(a) the step of forming a bottom pole layer on a lower core layer with a predetermined length from a surface facing a recording medium in the height direction;

(b) the step of forming a first insulating layer on the bottom pole layer and the lower core layer, and then planarizing the upper surfaces of the bottom pole layer and the first insulating layer to the same plane;

(c) the step of forming a nonmagnetic gap layer on at least the bottom pole layer;

(d) the step of forming a partial insulating layer on the bottom pole layer with the gap layer provided therebetween to start from a position at a predetermined distance from the surface facing the recording medium so that a gap depth is regulated by the predetermined distance;

(e) the step of forming a coil layer on a portion of the first insulating layer which is behind the partial insulating layer in the height direction, and coating the coil layer with a second insulating layer; and

(f) the step of forming an upper core layer on the gap layer, the partial insulating layer and the second insulating layer, in which the upper core layer comprises a narrow tip region formed on the gap layer and the partial insulating layer to be exposed with a track width at the surface facing the recording medium, and a rear end region formed on the second insulating layer so that the width

dimension in the track width direction gradually increases in the backward height direction from the end edge of the tip region.

24. A method of manufacturing a thin film magnetic head according to Claim 23, wherein in the step (d), the partial insulating layer is formed to extend to the top of the first insulating layer.

25. A method of manufacturing a thin film magnetic head according to Claim 24, wherein the partial insulating layer comprises an organic insulating layer.

26. A method of manufacturing a thin film magnetic head according to Claim 23, further comprising the following step (g) between the steps (b) and (c), and the following step (h) used instead of the step (e):

(g) the step of partially cutting the top of the first insulating layer to form a coil forming surface behind the bottom pole layer in the height direction; and

(h) the step of forming a coil layer on the coil forming surface, and coating the coil layer with a second insulating layer.